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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/668,582

09/23/2003

Alfred Stufflet

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EXAMINER

MALEK, LEILA

ART UNIT

PAPER NUMBER

2611

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/668,582	Applicant(s) STUFFLET ET AL.	
	Examiner LEILA MALEK	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14-23 and 25-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-12 and 14-22 is/are allowed.
- 6) ☒ Claim(s) 23,26,28-31 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 25,27,32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/22/2009 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: Applicant in the abstract and summary of the invention (see paragraph 0011), states that "the serial bus processor receives data from a plurality of look up tables which, in turn, are indexed by data received from an analog section. The serial bus processor then uses data values retrieved from the lookup tables to generate processed control data for controlling the digital module." This statement from the invention's disclosure contradicts the claimed subject matters cited by the Applicant in claims 1, 12, and 23, wherein Applicant states that "a plurality of look up tables indexed by data received from the digital radio module, wherein data values retrieved from the lookup tables may be used to generate processed data from controlling one of the plurality of analog radio modules".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 35 recites the limitation "the non-linearties" in line 2. There is insufficient antecedent basis for this limitation in the claim. The dependency of claim 35, should be changed from claim 23 to claim 25.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 23, 26, 28, 29, 30, 31, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beard (US 7,245,725), in view of Fischer et al. (hereafter, referred as Fischer) (US 5,768,695).

As to claim 23, Beard shows an apparatus (see Fig. 1) comprising: a serial bus processor (see blocks 2 and 4 and column 4, first and last paragraphs); a radio interface processor (see block 440) coupled to the serial bus processor; a plurality of analog radio modules (see e.g. blocks 40, 60, 80, and 100 and column 4, lines 42-46) and a digital module (see block 320). Beard discloses that the data values retrieved from the digital module may be used to generate processed data for controlling one of the plurality of analog radio modules (see column 7, lines 42-46 and Fig. 1, blocks 320, 200, and 440 and the connections between these blocks). Beard discloses all the subject

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matters claimed in claim 23, except that the radio interface processor is programmable and includes at least one memory mapped register. Beard also does not disclose a plurality of lookup tables indexed by data retrieved from the digital radio module. Fischer discloses an apparatus for providing a flexible interface for creating the necessary control signaling of a radio transmitter (see column 1, first paragraph). Fischer, further discloses a programmable radio interface unit 402 (see Fig. 3), which includes a register set 406, which is coupled to the state machine 404 (see column 4, lines 27-42). Since the radio interface unit is a control device, which controls the elements that are connected to it, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Beard's radio interface unit as suggested by Fischer to include the registers inside the radio interface device in order to save the control information of the other units. Also it would have been obvious to one of ordinary skill in the art at the time of invention to make the radio interface programmable to improve the flexibility of the device. Fischer is silent in disclosing that the registers are memory-mapped registers, however since the memory-mapped registers have the fastest mechanism for data retrieval (e.g. as evidence by Santos et al.¹), it would have been obvious to one of ordinary skill in the art at the time of invention to use these kind of registers instead of the registers used by Fischer for the reasons stated above. Beard and Fischer disclose all the subject matters claimed in claim 23, except for a plurality of lookup tables indexed by data received from the digital radio module. However, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Beard and

¹ Santos et al. (US 5,933,158, see column 24, first paragraph)

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save the output of the digital PLL on a plurality of look up tables for further processing the data. It is extremely well known in the art to save the output of one unit to facilitate non-real time data processing.

As to claim 26, Beard shows that the serial bus processor receives data from the digital module (or according to the combination of references disclosed, received data from a plurality of lookup tables saving the output of digital module) (see the connections of blocks 320, 200, 230, 250, 210, processors 4 and 2), and uses the values to generate processed data for controlling one of the plurality of analog radio modules (see the connections of blocks 2, 4, 210, 200, and 440).

As to claim 28, Beard shows that the radio interface processor is used to control the processed data generated by the serial bus processor (see Fig. 1, blocks 2, 4, 210, 200, and 440). Fischer further discloses that the radio interface unit 402 includes a state machine equipped to access the registers (see Fig. 3). It would have been obvious to one of ordinary skill in the art at the time of invention to use a radio interface unit as suggested by Fischer including a state machine having access to the register sets to provide the appropriate signals to the other parts of the system (see column 5, lines 4-6).

As to claim 29, Fischer discloses that the radio interface 402 includes a processor interface (the state machine 404 has been interpreted as processor interface) for accessing the register. It would have been obvious to one of ordinary skill in the art at the time of invention to use a radio interface unit as suggested by Fischer including a state machine (or processor interface) having access to the register sets to

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provide the appropriate signals to the other parts of the system (see column 5, lines 4-6).

As to claim 30, Beard discloses that the apparatus further includes a general-purpose Input/Output registers (see column 11, lines 8-19) for accessing the information from the radio interface unit (see the power control unit 710).

As to claim 31, Beard discloses that the apparatus further comprising a clock, coupled to the radio interface (see column 7, lines 1-6), for determining the relative timing of external events, and also for controlling the analog radio module (see column 7, lines 1-40).

As to claim 34, Beard and Fischer disclose all the subject matters claimed in claim 23, except that the RIP accesses controlling software that is programmed according to one or more specific electronic characteristics of a given analog radio module. However, since Beard discloses that the RIP provides control information to the analog module (see column 7, lines 42-46), it would have been obvious to one of ordinary skill in the art at the time of invention to use controlling software that is programmed according to one or more specific electronic characteristics of a given analog radio module, in order to make the RIP and the analog module compatible with each other.

As to claim 36, Beard discloses that the digital module is a time-division-duplex, user equipment, application-specific-integrated circuit (see column 4, lines 1-10 and column 11, lines 47-50).

Allowable Subject Matter

5. Claims 1 and 3-11 allowed. The following is a statement of reasons for the indication of allowable subject matter: a to claim 1, a comprehensive search of prior art of record failed to teach either alone or in combination a radio interface for interfacing any of a plurality of analog radio modules to a digital module, the interface comprising: a serial bus processor, a programmable radio interface processor (RIP) that includes at least one memory-mapped register configured to control data generated by the serial bus processor; and a plurality of lookup tables which are indexed by data received from the digital radio module, and which are programmed with data so as to compensate for one or more nonlinearities which may be present in one of the plurality of analog radio modules, but are not accounted for in the digital module; wherein the serial bus processor receives data from the plurality of lookup tables, and uses data values retrieved from the lookup tables to generate processed data for controlling one of the analog radio modules.

6. Claims 12 and 14-22 allowed. The following is a statement of reasons for the indication of allowable subject matter: a to claim 12, a method for interfacing any of a plurality of analog radio modules to a digital module in a system that comprises (i) a serial bus processor, (ii) a programmable radio interface processor (RIP) that includes one or more memory-mapped registers coupled to the serial bus processor, and (ii) a plurality of lookup tables; the method comprising: programming the plurality of lookup tables with data so as to compensate for one or more nonlinearities which may be present in one of the plurality of analog radio modules, but are not accounted for in the

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digital module; indexing the plurality of lookup tables using data received from the digital radio module; the serial bus processor receiving data from the plurality of lookup tables, and the serial bus processor using data values retrieved from the lookup tables to generate processed data for controlling one of the plurality of analog radio modules and controlling the processed data using the memory mapped registers.

7. Claims 25, 27, 32, 33, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEILA MALEK whose telephone number is (571)272-8731. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leila Malek
Examiner
Art Unit 2611

/L. M./
/Leila Malek/
Examiner, Art Unit 2611

/Mohammad H Ghayour/
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